

Commodity Highlight

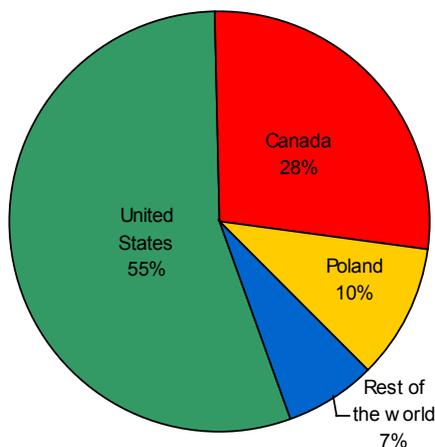
Trends in the U.S. Blueberry Industry

Blueberries are one of a few fruit crops that are indigenous to North America. It has been around for thousands of years but its cultivation is regarded as one of the most recent of the major fruit crops. As early as 1908, cross breeding programs were initiated using wild native plants from New Hampshire and New Jersey. The first fruit harvested from hybrid seedlings were shipped from a New Jersey farm in 1916. Before then, all blueberries were harvested from wild plants. It was, however, during the 1930s when several improved varieties were developed and released and subsequently introduced in North Carolina and Washington. Today, about 70 percent of the country's commercial blueberries are from cultivated varieties. Production from these varieties has nearly tripled in the last 33 years.

Production Concentrated in North America

Although blueberry production has been reported from more countries since the early 1990s than in previous years, much of the world is still quite unfamiliar with this berry. Production remains highly concentrated in North America, primarily in the United States and Canada. Presently, the United States continues to be the largest producer, supplying more than half of the world's production (fig. 3).

Figure 3
Top three world producers of blueberries*



*Average share of 2000-2002 world production.

Source: Food and Agriculture Organization of the United Nations.

Prior to the 1970s, Canada was the largest producer. Now, Canada produces 28 percent of world supplies, followed by Poland with 10 percent. Based on data from the Food and Agriculture Organization of the United Nations, per-hectare yields in the United States have averaged more than double those in Canada over the last 22 years, more than making up for the much smaller area harvested. Harvested acreage in the United States, however, is understated because annual acreage data for the wild blueberry crop are not reported.

Maine and Michigan Lead in Production

Maine and Michigan lead the country in blueberry production. Combined, they produce more than half of all U.S. blueberries. Maine is the Nation's largest producer of wild blueberries. Annual production data for the State reported by the U.S. Department of Agriculture's (USDA) National Agricultural Statistics Service (NASS) include only the wild crop, which over the last 3 years, averaged 83 million pounds, 30 percent of U.S. blueberry production (cultivated and wild combined). However, a very small fraction of the U.S. cultivated blueberry crop is produced in Maine. Based on the *1997 Census of Agriculture*, 68 farms in Maine harvested cultivated blueberries from a total of 319 acres, producing 605,675 pounds. A total of 569 farms in the State, meanwhile, harvested 23,693 acres of wild blueberries, totaling over 70 million pounds.

The *1997 Census of Agriculture* also reported 623 farms in Michigan that harvested 16,541 acres of cultivated blueberries. Michigan's production, entirely comprised of cultivated varieties, is slightly less than in Maine, averaging over 20 percent of the U.S. annual blueberry crop (cultivated and wild). It is the largest producing State for the cultivated crop. With the expansion in harvested acreage, Michigan's crop size has more than doubled since the 1970s. Production in the State, ranging from 55 million to 87 million pounds over the last 13 years, covered over 40 percent of the Nation's cultivated blueberry harvested acreage. In the most recent 3 years, harvested area in the State averaged 16,800 acres annually. New Jersey, Oregon, Georgia, North Carolina, and Washington are also major producing States with combined production averaging over 40 percent of the U.S. total.

Historically, annual cultivated blueberry production was reported for Michigan, New Jersey, North Carolina, Oregon, and Washington only. NASS began expanding their national survey to include blueberry production in Georgia, Indiana, New York, Alabama, Arkansas, and Florida beginning in 1992. Except for Georgia, these other smaller producing States each represent only a fraction of total production.

Production Classified Into Three Species

The blueberry is a perennial crop that can produce for more than 20 years. Because the berries do not mature uniformly, harvesting of the crop is done two to five times during the season. It takes some years, however, before returns on investments are generated from newly established fields. A planting takes about 2 to 3 years to establish, with harvesting starting around the third or fourth growing season.

Several species of blueberries are native to North America. The three most prominent species harvested and sold commercially in the United States are as follows:

- highbush -- thrives in the cooler climates of the northern temperate zone and is the major type grown in North America.
- rabbiteye -- more tolerant of the relatively warmer temperatures in the southern United States.
- lowbush -- harvested from managed wild stands in the northeastern U.S. (primarily in Maine) and eastern provinces of Canada.

Both the highbush and rabbiteye blueberries are cultivated commercially in the United States. About 95 percent of cultivated blueberries consist of the Northern highbush varieties. Unlike the highbush varieties that may grow to exceed 10 feet, the wild lowbush blueberries seldom grow to be more than 1.5 feet in height and produce smaller and darker berries. Rabbiteye varieties are not as winter-hardy as the Northern highbush varieties, but they are generally drought tolerant. They produce fruit that are relatively comparable to highbush varieties.

More recently, Southern highbush varieties have been developed to boost production potential in the southern United States. Besides being adaptable to growing conditions in the region, these new varieties

also inherit some characteristics of the Northern highbush, specifically having a late bloom date and a shorter ripening period. Both of these inherited characteristics help increase its overall appeal to southern growers. With the late bloom date, these varieties tend to face a lower risk of suffering from frost damage during the flowering stage, a critical period in fruit development. With the shorter ripening period, blueberries from Southern highbush varieties can be harvested around mid-April through late May, earlier than most rabbiteye varieties. Not only does this extend the marketing window for blueberries in the region but it also allows its growers to take advantage of premium prices typically available early in the season.

Blueberries Are the Second Most Important Berry

Next to strawberries, blueberries are the second most important berry in the United States. Over the last 3 years (2000-02), cultivated and wild blueberry production combined generated over \$200.0 million in farm value, about 13 percent of all U.S. berry production. Although blueberry grower prices generally average higher than strawberry grower prices, the annual average farm value of the U.S. blueberry crop falls well short of the over \$1.0 billion in farm value generated by the U.S. strawberry crop. This is mainly because of the sharp difference in quantity produced for both crops (for example, strawberry production averaged 1.8 billion pounds during 2000-2002 while blueberry production averaged 273.0 million pounds).

Today, most of the U.S. blueberries are commercially cultivated. During 2000 to 2002, commercial cultivation of the crop generated an annual crop value of \$178.0 million, nearly 87 percent of the value of total blueberry production. Although data two decades ago was not as complete as today, the rapid expansion in the cultivated crop size drove the annual crop value (cultivated) up sharply from an average of \$48.3 million in the early 1980s to an average of \$138.5 million during 1992-94. Similarly, despite yearly fluctuations, the crop value generated from commercial harvesting of managed wild stands in Maine also increased from an annual average of \$12.0 million during 1980-82 to \$23.4 million during 1992-94 and to \$27.9 million during 2000-02.

More Blueberries Are Processed

Blueberries are enjoyed both in its fresh or processed form. Historically, however, a larger proportion of U.S. blueberry production has been processed than sold for fresh consumption. Presently, over 65 percent of utilized production (cultivated and wild) in the United States is processed into storable products, allowing for year-round availability. The fresh-market product, on the other hand, is in season in the spring and summertime, mostly from mid-May through mid-August.

Although more than half of the U.S. blueberries processed comes from the cultivated crop, Maine is still the largest supplier of blueberries for processing. Almost all of its wild blueberry production is processed. From among the other producing States, it is only in Michigan, Oregon, Georgia, and Washington where a larger proportion of production is for processing than for fresh use (fig. 4). Large producers such as New Jersey and North Carolina, meanwhile, join other minor producing States in specializing more in fresh-market production. Both New Jersey and North Carolina, however, produce relatively large volumes overall. Their production for the processing sector still average about 4 percent and 3 percent of total processed blueberries, respectively.

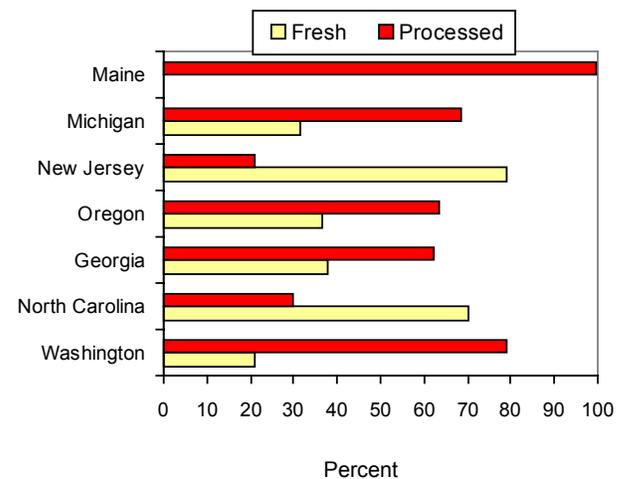
Processed blueberries are mostly frozen or dried and often used as an ingredient in the manufacture of many other processed products such as baked goods, yogurt, and ice cream. Frozen berries are bulk frozen or individually quick frozen (IQF), a process that ensures the berries' freshness while preserving many of its beneficial nutrients. Most of the wild blueberries, for example, are IQF for use in other processed food. Dried blueberries are ingredients in cereal and cereal products as well as many snack food products. Blueberries are also processed into jam/jellies, syrup, juice/concentrates, and baby food.

U.S. Blueberry Crop Expands Rapidly

U.S. blueberry production has grown rapidly over the last three decades. Production has increased sharply for both the cultivated and wild crop (fig. 5). Continued efforts to breed new and improved varieties to boost yields along with more intensive management practices (including irrigation, fertilization, and weed control) and the expansion in

Figure 4

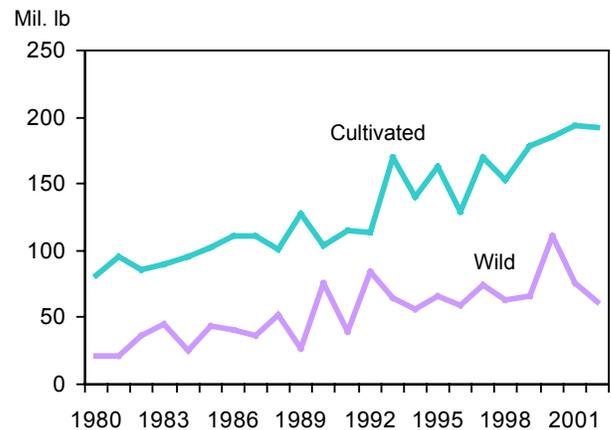
U.S. blueberries: Fresh and processed share of utilized production among major-producing States



Source: National Agricultural Statistics Service, USDA.

Figure 5

U.S. blueberry production, 1980-2002



Source: National Agricultural Statistics Service, USDA.

harvested area were behind the rapid growth in the U.S. cultivated blueberry crop. Domestic production of the cultivated crop increased from an average of 64 million pounds during the 1970s to around 144 million pounds during the 1990s. Record-high yields brought production to a peak 2 years ago, at around 193 million pounds, despite a decline in acreage that year, mostly due to a reduction in North Carolina.

Cultivated production in Michigan increased significantly over the last several years, but stronger production growth has occurred in the other key producing States (OR, GA, WA, NC, and NJ). Larger

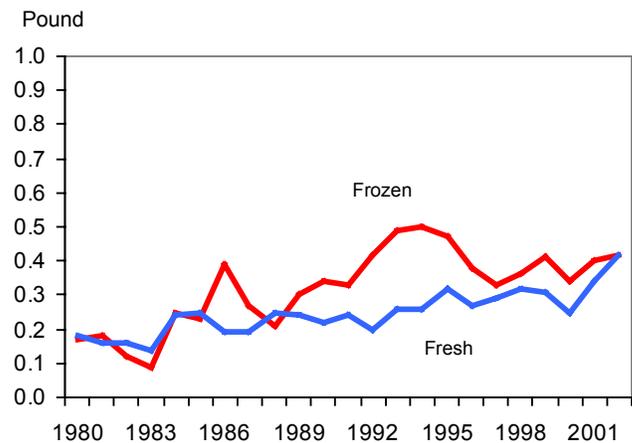
increases in either average yields per acre or harvested acreage or both have resulted in the strong growth in each of these five States. Presently, average yields in these key States range from 20 percent to 162 percent higher than in Michigan. Although Michigan accounted for the largest blueberry area under irrigation, it was the only major producing State whose irrigated share of harvested area diminished from 62 percent in 1992 to 57 percent in 1997, based on the Census of Agriculture. The highest average yields are in Oregon (averaging 10,173 pounds per acre) and Washington (averaging 7,100 pounds) where 96 percent and 78 percent of the harvested acres were irrigated.

Increased use of selective herbicides and irrigation to boost yields have aided in the rapid expansion of the U.S. wild blueberry crop over the last several years. Presently, Maine's wild blueberry crop averages 83 million pounds annually, nearly quadruple the quantity harvested during the 1970s. Although Maine is the only State that has annual data on wild blueberry production, small quantities are also produced in other States. According to the 1997 *Census of Agriculture*, Maine accounted for 99 percent of U.S. wild blueberry production, with the remaining share split mostly among Northeastern States, including New Hampshire, Massachusetts, New York, New Jersey, Pennsylvania, Vermont, and West Virginia. Data on annual average yields and acreage are not available for the wild blueberry crop in Maine because they are difficult to estimate.

Technological Innovations, Production Expansion, Health Attributes, and Convenience Help Shape Domestic Demand

Demand for blueberries in the United States has generally been on the rise since the 1980s, with domestic consumption of fresh and frozen blueberries both increasing over the years (fig. 6). Americans consumed more fresh blueberries back in the early- to mid-1980s but demand has shifted to the frozen product for the most part after 1985. This shift may be attributed to innovations in freezing technology such as the use of IQF and increased domestic supplies of frozen blueberries resulting from large production increases in Maine and in the Pacific Northwest where a majority of production is processed.

Figure 6
U.S. per capita consumption of fresh and frozen blueberries



Source: Economic Research Service, USDA.

Americans' growing appetite for fresh produce, influenced to a large part by their increased desire for a healthy and nutritious diet, has aided in boosting demand for fresh blueberries in the United States during the 1990s. Per capita fresh blueberry consumption averaged 0.20 pound annually during the early 1990s, increasing to 0.34 pound during 2000-2002. Blueberries are found to be low in calories and a rich source of vitamin C, potassium, and fiber. They also contain plant chemicals that may help prevent some forms of cancer, heart disease, urinary tract infections, and improve vision. More recently, there is growing evidence in the ability of blueberries to slow the aging process, including memory loss. Aside from the good taste and health benefits that it offers, today's busy consumer enjoys the convenience of fresh blueberries relative to other fresh fruit because it does not require any peeling or slicing. After washing, the berries are ready to be eaten, either by itself, with cereals, or in fruit salads.

Increasing fresh-market production through most of the 1990s has helped narrow the gap in per capita consumption between fresh and frozen blueberries since the mid-1990s. Part of this production increase may be attributed to more complete reporting as six other States (AL, AR, FL, GA, IN, and NY) have been included in the NASS production survey beginning in 1992. As mentioned earlier, these additional States, with the exception of Georgia, produce blueberries primarily for the fresh market.

Strong Domestic Demand Increased Importance Of Imports

While the domestic market is still largely dependent on its own production, imports have also increased their presence in the U.S. fresh blueberry market. Together with increasing volume, imports as a share of domestic consumption rose from 24 percent during the 1980s to around 48 percent over the last 3 years (2000-2002). Canada is the source of most fresh blueberries imported to the United States. Earlier in the 1990s, U.S. imports of Canadian blueberries accounted for over 90 percent of all fresh imports. Presently, however, this share has dropped to over 80 percent, reflecting large increases in imports from South American countries such as Chile and Argentina in the last few years. Imports from both countries have provided U.S. consumers access to fresh blueberries at retail grocery stores during the U.S. off-season, aiding in increasing fresh blueberry consumption in the United States.

While both the health and convenience factors boosted fresh blueberry consumption, they also were behind the increased demand for processed blueberries. Moreover, U.S. imports of frozen blueberries have increased over time and have played an increasing role in domestic frozen blueberry consumption. The average share of frozen blueberry imports to domestic consumption of frozen blueberries rose from 21 percent during the 1980s to 42 percent during the period 2000-2002. Almost all frozen imports to the United States come from Canada.

Estimates for domestic consumption of frozen blueberries increased from an average of 0.22 pound per person annually during the 1980s to 0.39 pound per person during the period 2000-2002. Despite a

decline in production, consumption was at a record-high in 1994, at 0.50 pound per person, aided by large beginning inventories and a 61-percent increase in imports.

Exports Also Expanding

Most of the blueberries produced in the United States are utilized for domestic consumption. Exports of blueberries, however, have expanded over time, increasing more rapidly for fresh blueberries. Presently, the United States exports more fresh blueberries than frozen. Over the last 3 years, U.S. fresh blueberry exports averaged 38 million pounds, increasing in share of domestic production from 28 percent during the 1980s to 44 percent. For the same time period, around one-fourth of the U.S. frozen pack remained destined for the export market, averaging 25 million pounds during 2000-2002.

Canada remains as the major export market for U.S. blueberries. The United States currently ships over 90 percent of its fresh blueberry exports and half of its frozen blueberry exports to this market. Promotional efforts, however, were successful in introducing this berry to Japan, currently a growing market for U.S. blueberries. U.S. frozen blueberry exports to Japan increased dramatically beginning in the mid-1990s, averaging now around 11 million pounds annually, 40 percent of U.S. frozen blueberry exports. Earlier in the 1990s (1993-95), their share of U.S. frozen blueberry exports was only 8 percent. U.S. fresh blueberry exports to Japan increased sharply in 1999 and averaged over 2.0 million pounds annually since then. Now, Japan accounts for 7 percent of total U.S. fresh blueberry exports, up from only a fraction early into the 1990s.